

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee: NEIL FREDERICK HALEY et al.

Issue Date: October 19, 2004

Patent No.: 6,806,020

Appln. No.: 09/933,864

Filing Date: August 21, 2001

Title: NEGATIVE WORKING  
IMAGEABLE COMPOSITION  
CONTAINING SULFONIC ACID

Examiner: Chu, John S Y

Group Art Unit: 1752

Docket No. 58575-279177

Certificate

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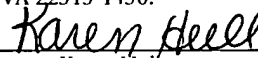
of Correction

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Commissioner for Patents

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Karen Hull**REQUEST FOR EXPEDITED ISSUANCE OF  
CERTIFICATE OF CORRECTION OF PATENT UNDER 37 C.F.R. § 1.322**

The enclosed Certificate of Correction (PTO/SB/44) is submitted to correct errors in this patent arising as a result of an Office mistake.

No fee is believed to be necessary. Should any fee be required, the Commissioner is authorized to charge our Deposit Account No. 06-0029 and is requested to notify us of the same.

Issued claims 45 and 46 (application claims 49 and 50) were introduced in the Amendment filed on June 20, 2003 and were allowed by the Examiner as filed on June 20, 2003. A copy of the Amendment is enclosed.

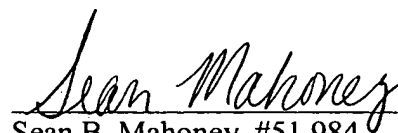
A certified Certificate of Correction is respectfully requested.

Respectfully Submitted,

NEIL FREDERICK HALEY et al.

Dated: November 5, 2004

By:

  
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## UNITED STATES PATENT AND TRADEMARK OFFICE

## CERTIFICATE OF CORRECTION

PATENT NO : 6,806,020 B2

DATED : October 19, 2004

INVENTOR(S) : NEIL FREDERICK HALEY et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 45, Line 28, delete the word "thean" and replace it with -- than --.

Claim 46, Line 30, delete the word "thean" and replace it with -- than --.

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PATENT NO. 6,806,020

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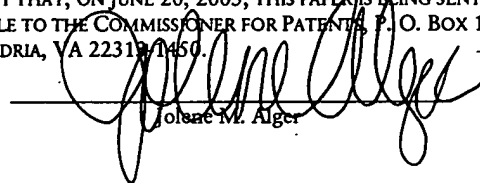
PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

<b>Applicant:</b> NEIL FREDERICK HALEY et al.	<b>Examiner:</b> Chu, John S Y
<b>Serial No.:</b> 09/933,864	<b>Group Art Unit:</b> 1752
<b>Filed:</b> August 21, 2001	
<b>For:</b> NEGATIVE WORKING IMAGEABLE COMPOSITION CONTAINING SULFONIC ACID	<b>Docket No.</b> 58575-279177

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I CERTIFY THAT, ON JUNE 20, 2003, THIS PAPER IS BEING SENT VIA  
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Joseph M. Alger

**AMENDMENT**

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### **INTRODUCTORY COMMENTS**

This Amendment is responsive to the outstanding Office Action mailed March 20, 2003. A fee for added claims is included with this Amendment. If any additional fee is required for entry of this paper, the Commissioner is authorized to charge our Deposit Account 06-0029 and is requested to notify us of the same.

Please amend the application as follows:

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### AMENDMENTS TO THE CLAIMS

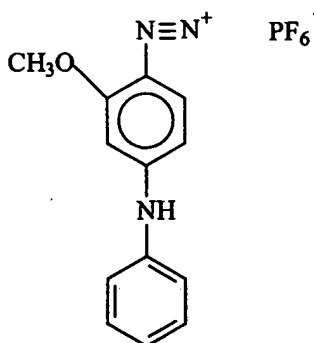
1. (Currently Amended) An imageable composition comprising:
  - an acid curable composition;
  - an acid generator; and
  - a ~~strong~~ sulfonic acid represented by the formula  $R-SO_3H$ , wherein R is a substituted or unsubstituted hydrocarbyl of 1 to 22 carbon atoms, or a substituted or unsubstituted aryl of 6 to 22 carbon atoms.
2. (Currently Amended) The composition of claim 1, wherein said acid curable composition comprises:
  - a crosslinkable binder; and
  - a crosslinking agent for said binder.
3. (Original) The composition of claim 2, wherein said binder comprises a polymer having at least two reactive groups each independently selected from the group consisting of: hydroxy, carboxylic acid, amine, carbamate, amide, sulfonamide and imide.
4. (Currently amended) The composition of claim ~~3~~ 2, wherein said ~~reactive group in said binder comprises a polymer is a~~ having at least two reactive hydroxy-group groups.
5. (Currently amended) The composition of claim ~~4~~ 2, wherein said ~~polymer is binder comprises a polymer~~ selected from the group consisting of: a polyol, a polyether polyol, a novolak resin, a resole resin, a hydroxyfunctional acrylic resin, a hydroxyfunctional polyester resin and combination thereof.
6. (Currently amended) The composition of claim 2, wherein said binder ~~is~~ comprises a novolak resin.
7. (Currently amended) The composition of claim 2, ~~wherein said comprising a crosslinking agent is selected from the group consisting of: a resole resin, an amino resin, an amido resin, an epoxy compound having at least two epoxide groups and a combination thereof.~~

8. (Currently amended) The composition of claim-~~7~~2, wherein said crosslinking agent is comprises a resole resin.
9. (Cancelled)
10. (Currently amended) The composition of claim-~~7~~2, wherein said crosslinking agent is comprises an amino resin having at least two alkoxymethyl groups.
11. (Original) The composition of claim 10, wherein said amino resin is selected from the group consisting of: an alkoxymethylated melamine resin, an alkoxymethylated benzoguanamine resin, an alkoxymethylated glycoluril, an alkoxymethylated polyacrylamid, an alkoxymethylated polymethacrylamid and a combination thereof.
12. (Currently amended) The composition of claim-~~11~~10, wherein said amino resin is an alkoxymethylated melamine resin having from about 2 to about 6 methoxymethyl groups.
13. (Original) The composition of claim 2, further comprising an isocyanate crosslinker having at least two isocyanate groups.
14. (Original) The composition of claim 1, wherein said acid generator is an ultraviolet, visible or infrared radiation or heat activated compound.
15. (Currently amended) The composition of claim-~~14~~1, ~~wherein said comprising~~ comprising an acid generator is selected from the group consisting of: an onium salt, a covalently bound sulfonate group containing compound, hydrocarbylsulfonamido-N-hydrocarbyl sulfonate and a combination thereof.
16. (Currently amended) The composition of claim-~~15~~1, wherein said acid generator is comprises an onium salt.
17. (Original) The composition of claim 16, wherein said onium salt has a non-nucleophilic counteranion selected from the group consisting of: tetrafluoroborate, hexafluorophosphate, hexafluoroarsenate, hexafluoroantimonate, triflate,

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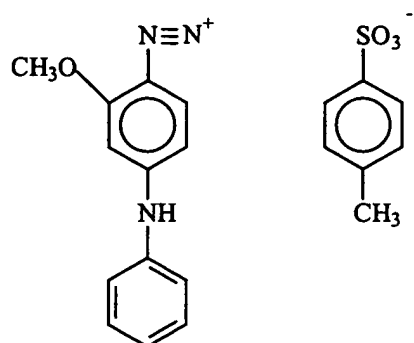
tetrakis(pentafluorophenyl)borate, pentafluoroethyl sulfonate, p-methylbenzene sulfonate, ethyl sulfonate, trifluoromethyl acetate and pentafluoroethyl acetate.

18. (Original) The composition of claim 16, wherein said onium salt is selected from the group consisting of: an iodonium salt, a sulfonium salt, a hydrocarbyloxysulfonium salt, a hydrocarbyloxyammonium salt, an aryl diazonium salt and a combination thereof.
19. (Currently amended) The composition of claim ~~18~~ 16, wherein said ~~hydrocarbyloxyammonium~~ onium salt is a salt of an N-hydrocarbyloxy substituted nitrogen containing heterocyclic compound.
20. (Currently amended) The composition of claim ~~19~~ 16, wherein said ~~N-hydrocarbyloxy substituted nitrogen containing heterocyclic compound~~ onium salt is N-ethoxyisoquinolinium hexafluorophosphate.
21. (Currently amended) The composition of claim ~~18~~ 16, wherein said ~~iodonium~~ onium salt is 4-octyloxyphenyl phenyliodonium hexafluoroantimonate.
22. (Currently amended) The composition of claim ~~18~~ 1, wherein said acid generator is a monomeric or oligomeric aromatic diazonium salt.
23. (Original) The composition of claim 22, wherein said diazonium salt is selected from the group consisting of:  
2-methoxy-4-phenylaminobenzene diazonium hexafluorophosphate (diazo MSPF6)  
represented by the formula:

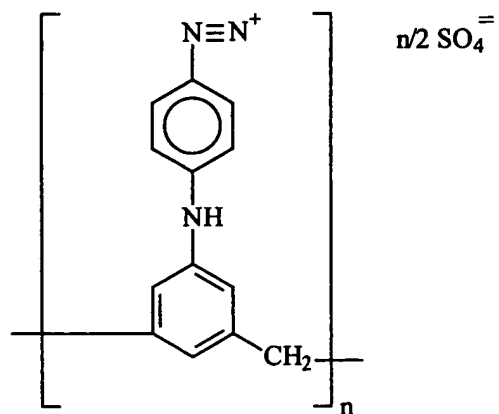
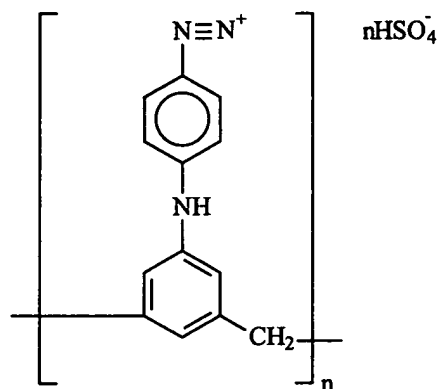


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2-methoxy-4-phenylaminobenzenediazonium p-toluenesulfonate represented by the formula:



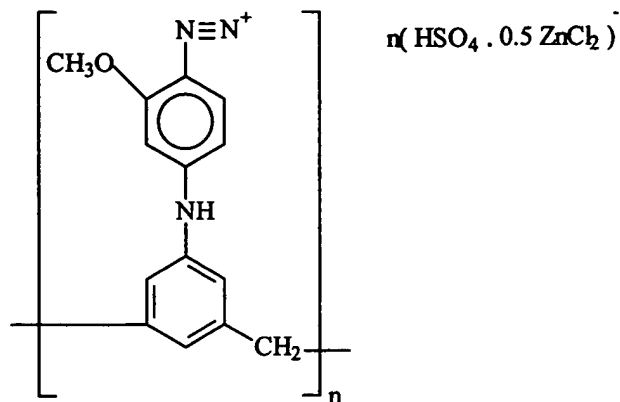
an oligomeric diazonium salt selected from the group consisting of compounds represented by the formula:



and

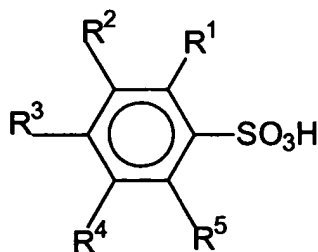
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wherein n is from 1 to 11; and a combination of any of the aforementioned compounds.

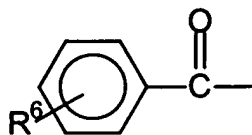
24. (Currently amended) The composition of claim 1, wherein said ~~strong~~ sulfonic acid is an acid having a pKa of not more than about 5.
25. (Currently amended) The composition of claim 1, wherein said ~~strong~~ sulfonic acid is an acid having a pKa of not more than about 4.
26. (Cancelled)
27. (Currently amended) The composition of claim-26 1, wherein R is selected from the group consisting of: linear, branched or cyclic alkyl of 1 to 22 carbon atom, linear, branched or cyclic haloalkyl of 1 to 22 carbon atom having at least one halogen and a mixture thereof.
28. (Currently amended) The composition of claim-26 1, wherein said sulfonic acid is an aryl sulfonic acid represented by the formula:



wherein each of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> is independently selected from the group consisting of: hydrogen, alkyl of 1 to 12 carbon atoms, haloalkyl of 1 to 22 carbon atoms having at

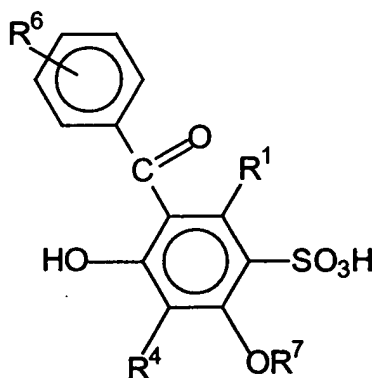
least one halogen, aryl of 6 to 12 carbon atoms, halogen, hydroxy, alkoxy, cyano, nitro, alkoxy carbonyl and acyl.

29. (Original) The composition of claim 28, wherein said acyl is represented by the formula:



wherein R<sup>6</sup> is selected from the group consisting of: hydrogen, alkyl of 1 to 12 carbon atoms, haloalkyl of 1 to 12 carbon atoms having at least one halogen, alkoxy, cyano, nitro, alkoxy carbonyl and acetyl.

30. (Currently amended) The composition of claim ~~28~~ 1, wherein said ~~aryl~~ sulfonic acid is represented by the formula:



wherein each of R<sup>1</sup>, R<sup>4</sup> and R<sup>6</sup> is independently selected from the group consisting of: hydrogen, alkyl of 1 to 12 carbon atoms, haloalkyl of 1 to 12 carbon atoms having at least one halogen, aryl of 6 to 12 carbon atoms, halogen, hydroxy, alkoxy, cyano, nitro, alkoxy carbonyl and acyl and wherein R<sup>7</sup> is selected from the group consisting of: hydrogen, alkyl of 1 to 12 carbon atoms, haloalkyl of 1 to 12 carbon atoms having at least one halogen, aryl of 6 to 12 carbon atoms, alkoxy carbonyl and acyl.

31. (Currently amended) The composition of claim ~~30~~ 1, wherein said ~~aryl~~ sulfonic acid is 3-benzoyl-4-hydroxy-6-methoxybenzenesulfonic acid.

32. (Original) The composition of claim 1, further comprising a photothermal converter material.

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33. (Original) The composition of claim 1, further comprising an infrared absorber.
34. (Original) The composition of claim 33, wherein said infrared absorber is selected from the group consisting of: a pigment, a dye and a combination thereof.
35. (Cancelled)
36. (Cancelled)
37. (Currently amended) An imageable element comprising:  
a substrate; and  
an imageable composition coated on a surface of said substrate,  
said composition comprising: an acid curable composition; an acid generator; and a strong-sulfonic acid represented by the formula  $R-SO_3H$ , wherein R is a substituted or unsubstituted hydrocarbyl of 1 to 22 carbon atoms, or a substituted or unsubstituted aryl of 6 to 22 carbon atoms.
38. (Currently amended) The imageable element of claim 37, wherein said ~~thermally~~ imageable composition ~~further~~ comprises an infrared absorber.
39. (Currently amended) The imageable element of claim 37, wherein said ~~thermally~~ imageable composition comprises a photothermal converting material.
40. (Currently amended) A method of producing an imaged element comprising the steps of:  
providing a thermally imageable element comprising a substrate and a thermally imageable composition coated on a surface of said substrate, said composition comprising an acid curable composition, an acid generator and a strong-sulfonic acid represented by the formula  $R-SO_3H$ , wherein R is a substituted or unsubstituted hydrocarbyl of 1 to 22 carbon atoms, or a substituted or unsubstituted aryl of 6 to 22 carbon atoms;  
imagewise exposing said imageable element to heat with a hot stylus to produce an imagewise exposed element having exposed and unexposed regions;  
baking said imagewise exposed element at a temperature and period of time

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sufficient to produce a cured element; and

contacting said cured element and a developer to remove the unexposed regions and thereby produce said imaged element.

41. (Currently amended) A method of producing an imaged element comprising the steps of:

providing an imageable element comprising a substrate and an imageable composition coated on a surface of said substrate, said composition comprising an acid curable composition, an acid generator, ~~and a strong acid,~~ and an infrared absorber or photothermal converter;

imagewise exposing said imageable element to radiation to produce an imagewise exposed element having exposed and unexposed regions;

baking said imagewise exposed element at a temperature and period of time sufficient to produce a cured element; and

contacting said cured element and a developer to remove the unexposed regions and thereby produce said imaged element.

42. (Currently amended) The method of claim 41, wherein said ~~thermally~~-imageable composition ~~further~~ comprises an infrared absorber.

43. (Currently amended) The method of claim 41, wherein said ~~thermally~~-imageable composition ~~further~~ comprises a photothermal converter.

44. (Original) The method of claim 41, wherein said exposing step is carried out using an infrared laser.

45. (New) The imageable element of claim 37, wherein the substrate is an aluminum sheet.

46. (New) The method of claim 41, wherein the acid curable composition comprises:  
a crosslinkable binder; and  
a crosslinking agent for said binder.

47. (New) The method of claim 46, wherein said binder comprises a novolak resin.

48. (New) The method of claim 46, wherein said crosslinking agent comprises a resole resin.
49. (New) The method of claim 41, wherein said strong acid is an acid having a pKa of not more than about 5.
50. (New) The method of claim 41, wherein said strong acid is an acid having a pKa of not more than about 4.
51. (New) The method of claim 41, wherein said strong acid is a sulfonic acid.
52. (New) The method of claim 41, wherein said strong acid is a sulfonic acid represented by the formula  $R-SO_3H$ , wherein R is a substituted or unsubstituted hydrocarbyl of 1 to 22 carbon atoms, or a substituted or unsubstituted aryl of 6 to 22 carbon atoms.
53. (New) An imageable composition comprising:  
an acid curable composition;  
an acid generator;  
a strong acid; and  
an infrared absorber or photothermal converter.
54. (New) The composition of claim 53, wherein said acid curable composition comprises:  
a crosslinkable binder; and  
a crosslinking agent for said binder.
55. (New) The composition of claim 54, wherein said binder comprises a novolak resin.
56. (New) The composition of claim 54, wherein said crosslinking agent comprises a resole resin.
57. (New) The composition of claim 53, wherein said strong acid is an acid having a pKa of not more than about 5.
58. (New) The composition of claim 53, wherein said strong acid is an acid having a pKa of not more than about 4.

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59. (New) An imageable element comprising:
- a substrate; and
  - an imageable composition coated on a surface of said substrate,
- said composition comprising: an acid curable composition; an acid generator; a strong acid; and an infrared absorber or photothermal converter.
60. (New) The imageable element of claim 59, wherein the substrate is an aluminum sheet.
61. (New) An imageable composition comprising:
- an acid curable composition;
  - an acid generator; and
  - a sulfonic acid having a pKa of not more than about 8.

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## REMARKS

The above-listed claim amendments along with the following remarks are fully responsive to the Office Action set forth above. Claims 1, 2, 4-8, 10, 12, 15, 16, 19-22, 24, 25, 27, 28, 30, 31, and 37-43 are amended and claims 9, 26, 35, and 36 are cancelled. New claims 45-61 are added. Claims 1-8, 10-25, 27-34, and 37-61 are pending after entry of this Amendment. No new matter is presented by the claim amendments or the new claims. Support for the new claims may be found in the claims originally filed, and throughout the specification.

The Examiner objected to claims 26-36, 38, 39 and 42-44 as dependent from a rejected base claim, and indicated that the claims would be allowable if rewritten in independent form. Claim 1 is amended to include a sulfonic acid represented by the formula  $R-SO_3H$ , wherein R is a substituted or unsubstituted hydrocarbyl of 1 to 22 carbon atoms, or a substituted or unsubstituted aryl of 6 to 22 carbon atoms, as was formerly recited in claim 26. Claim 26 is now cancelled. Claims 37 and 40 are also amended to include a sulfonic acid represented by the formula  $R-SO_3H$ , wherein R is a substituted or unsubstituted hydrocarbyl of 1 to 22 carbon atoms, or a substituted or unsubstituted aryl of 6 to 22 carbon atoms.

The Examiner stated that none of the cited references discloses the use of an infrared sensitive or photothermal conversion material in a negative photoresist with a strong acid. Claim 41 is directed to a method of producing an imaged element from an imageable element comprising a substrate and an imageable composition coated on a surface of the substrate. Claim 41 is amended to recite that the imageable composition includes an infrared absorber or photothermal converter. Support for the amendment can be found in original claims 42 and 43.

Claim 24 is amended to recite that the sulfonic acid is an acid having a pKa of not more than about 5. Support for this amendment can be found in the specification at page 12, lines 14-15.

Other claim amendments are made to more distinctly claim the subject matter that the Applicants regard as their invention.

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### **Claim Rejections – 35 U.S.C. § 112**

The Examiner rejected claim 22 as indefinite for improperly limiting the claim from which it depends. Claim 22 is amended to depend from claim 14, rendering the rejection moot. Withdrawal of the rejection is requested.

### **Claim Rejections – 35 U.S.C. § 102**

The Examiner rejected claims 1-4, 7, 10, 11, 14, 15, 24, 25, 37, 40 and 41 under 35 U.S.C. § 102(e) as anticipated by U.S. Patent 6,416,928 to Ohsawa, *et al.* ("Ohsawa"), or U.S. Patent 6,406,829 to Tachikawa, *et al.* ("Tachikawa").

The Examiner states that both Ohsawa and Tachikawa report imageable compositions having the recited elements.

Independent claims 1, 37, and 40 are amended to recite that the imageable compositions include a sulfonic acid represented by the formula  $R-SO_3H$ , wherein R is a substituted or unsubstituted hydrocarbyl of 1 to 22 carbon atoms, or a substituted or unsubstituted aryl of 6 to 22 carbon atoms. The cited references do not report imageable compositions comprising the recited sulfonic acid. Therefore, claims 1, 37, and 40, and the claims that depend therefrom, are not anticipated by the cited references. Withdrawal of the rejection is requested.

Claim 41 is amended to recite that the imageable composition includes an infrared absorber or photothermal converter. The Examiner stated that none of the cited references discloses the use of an infrared sensitive or photothermal conversion material in a negative photoresist with a strong acid. Therefore, claim 41 as amended is not anticipated by the cited references. Withdrawal of the rejection is requested.

### **Claim Rejections – 35 U.S.C. § 103**

The Examiner rejected claims 1-25, 37, 40 and 41 under 35 U.S.C. § 103 as unpatentable over U.S. Patent 6,416,928 to Ohsawa, *et al.* ("Ohsawa") or U.S. Patent

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6,406,829 to Tachikawa, *et al.* ("Tachikawa") in view of U.S. Patent 6,242,101 to Schwalm, *et al.* ("Schwalm").

Independent claims 1, 37, and 40 are amended to include a sulfonic acid represented by the formula  $R-SO_3H$ , wherein R is a substituted or unsubstituted hydrocarbyl of 1 to 22 carbon atoms, or a substituted or unsubstituted aryl of 6 to 22 carbon atoms.

The cited references, alone or in combination, neither teach nor suggest an imageable composition comprising an acid curable composition, an acid generator, and the recited sulfonic acid. Therefore, claims 1, 37, and 40, and the claims that depend therefrom, are not obvious in view of the cited references. Withdrawal of the rejection is requested.

Claim 41 is amended to recite that the imageable composition includes an infrared absorber or photothermal converter. The Examiner stated that none of the cited references discloses the use of an infrared sensitive or photothermal conversion material in a negative photoresist with a strong acid. Therefore, claim 41 as amended is not obvious in view of the cited references. Withdrawal of the rejection is requested.

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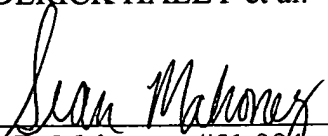
## Conclusion

All pending claims are now in condition for allowance. A notice to that effect is respectfully requested.

Respectfully Submitted,

NEIL FREDERICK HALEY et al.

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Dated: May 20, 2003

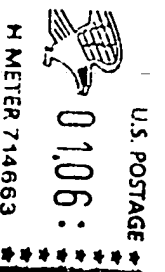
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Serial No.: 09/933,864

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